REMARKS

Applicants have carefully considered and responded to the Examiners Office Actions of December 19, 2003, and August 12, 2004.

In accordance with the Examiner's suggestion of December 19, 2003, the withdrawn Claims 1-13, 36, and 37 have now been reiterated, and the canceled Claims 17-19, 23, 24, 28-30, 34, and 35 have not been reiterated, as reflected in the current Amendment. Additionally, in accordance with the Office Action of August 12, 2004, the repeated Claims 31 and 36 have been removed. All claims are now properly numbered and the Amendment filed herein now complies with 37 C.F.R. 1.121 (c).

Pending in this Application are Claims 14-16, 20-22, 25-27, 31-33, and 38-39.

Claims 1-13, 36 and 37 have been withdrawn from consideration and reiterated;

Claims 17, 18, 19, 23, 24, 28, 29, 30, 34, and 35 have been canceled without prejudice, and are not reiterated;

Claims 14, 20, 21, 22, 25, 31, and 33 have been amended; and

Claims 38 - 39 are new.

The amended claims and the new claims find support throughout the specification, including the following sections:

Claims 14, 20, 21, and 22	Page 8, lines 22-23; Example 2, Page 16, lines 13-15; and Figure 7.
Claims 25, 31, 32, and 33	Page 8, lines 22-23; Example 2, Page 16, lines 13-15; and Figure 7.
Claims 38-39	Page 8, lines 22-23; Example 2, Page 16, lines 13-15; and Figure 7.

Additionally Applicants have carefully considered this Application in connection with the Examiner's Action dated March 14, 2003, and respectfully traverse the Examiner's rejections directed toward this Application in view of the above Amendment and the following remarks. As recommended by the Examiner, sequence identifiers ("SEQID: No:") have been inserted to replace laboratory designations for particular protein/receptors and

peptide sequences. This is reflected in the Amendment to the Specification where the SEQID: No:'s have been added. A new SEQID listing is also provide in Appendix 1. The addition of the SeqID NO:'s is not new matter.

I. Objection to Claim Language:

The Examiner has objected to Claim 25 and has suggested that the word "produce" should be changed to the word "produced."

In accordance with the Examiner's suggestion this typographical error has been corrected.

II. Rejections Under 35 U.S.C. §112, Second Paragraph

The Examiner has rejected Claims 14-35 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter that the applicant regards as the invention.

In particular, the Examiner recited Claim 14 and Claim 25:

".....'injecting an animal with a synthetic or recombinant proteinaceous molecule or biological equivalent of a natural killer cell surface receptor...' It is unclear if the limitation of ' a natural killer cell surface receptor' is to be applied to the proteinaceous molecule, or if said limitation is only to be applied to 'biological equivalent'. Further, it is unclear what constitutes a biological equivalent of a NK cell surface receptor, therefore the metes and bounds of the claims cannot be determined."

Applicants have addressed this issue by amending the limitation phrase "a synthetic or recombinant proteinaceous molecule or biological equivalent of a natural killer cell surface receptor." The new limitation phase in the Amended claims reads "a proteinaceous molecule....." "wherein, the proteinaceous molecule further comprises a synthetic proteinaceous molecule, or a recombinant proteinaceous molecule having a peptide sequence:

CQNRNRERVDFP (SEQID#3);

CMEHGEEDVIY(SEQID#4);

CQEEYEEKKRVDICRE (SEQID#5); or combination thereof."

Furthermore, the term "...biological equivalent of an NK cell surface receptor..." has been removed from the each of claims where it had appeared. Support for the amended claims appear on Page 8, lines 22-23; Example 2 Page 16, lines 13-15; and Figure 7. The Examiner has recommended that vague and indefinite terms such as the recitation of CS1 in Claims 18, 22, 24, 29, 33, and 35 should be replaced with sequence identifiers. As suggested by the Examiner, sequence identifiers are used in the amended Claims 22, and 33. Claims 18, 24, 29, and 35 have been canceled.

III. Rejections Under 35 U.S.C. §112, Second Paragraph

The Examiner has rejected Claims 14-35 as containing subject matter that was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. In particular, the Examiner cited several claims that were drawn to a "subfamily of receptors, that have not been disclosed in the art," "the specification provides not definition of a biological equivalent NK cell surface receptor," and "Claims 18, 22, 24, 29, 33, and 35 are dependent upon the CS1 receptor, but the metes and bounds of the CS1 receptor are unclear."

Applicants have eliminated the term "biological equivalent" from the amended claims and have further limited the amended claims to antibodies and fusion cell lines that are dependant on proteinaceous molecules having specific sequence identifiers (e.g. SEQID#3, SEQID#4, and SEQID#5). Support for the amended claims appear on Page 8, lines 22-23; Example 2 Page 16, lines 13-15; and Figure 7. Claims 18, 24, 29, and 35 have been canceled. Thus, the Applicants believe that the amended claims fully addresses the Examiner's concern of having claims:

"drawn to antibodies and fusion cell lines that are dependent upon binding to three genus of proteins: all synthetic or recombinant proteinaceous molecules, and an undisclosed sub-family of the CD2 receptors and all potential variants of the CS1 receptor, which was not known in the art at the time of filing."

Applicants therefore traverse the Examiner's rejections and respectfully request the Examiner withdraw the rejections.

IV. Rejections Under 35 U.S.C. § 102

A. 35 U.S.C. 102(e).

The Examiner has rejected Claims 14-16 and 25-27 under 35 U.S.C. 102(e) as being anticipated U.S. Patent 6,114,143 with Eda et al., listed as inventors ("the Eda '143 Patent"). The Examiner has also stated that:

"The Eda '143 Patent disclose a method for making a monoclonal antibody, the monoclonal antibody and fusion cell line made thereby which is the same as that claimed 'in the current invention."

The amended Claims 14-16 and 25-27 now contain specific limitations (e.g. SeqID#3, SeqID#4, SeqID#5 or combination thereof) on the proteinaceous molecules that are utilized to produce the monoclonal antibodies and fusion cell lines. Support for the amended claims appear on Page 8, lines 22-23; Example 2 Page 16, lines 13-15; and Figure 7.

A claim is only anticipated if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *See Verdegaal Bros. v. Union Oil Co. of California*, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987).

The Eda '143 Patent does not describe, either expressly or inherently, the Applicants' claimed monoclonal antibody, as amended, or cell fusion line, as amended, having the specific limitations of SeqID#3, SeqID#4, SeqID#5 or combination thereof. Thus, the Eda '143 Patent could not have been anticipated Claims 14-16 and 25-27. Applicants therefore traverse the Examiner's rejections and respectfully request the Examiner withdraw the rejections.

B. 35 U.S.C. 102(b).

The Examiner has also rejected Claims 14-16, 19, 20, 25-27, 30 and 32 under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 5,770,387 with Litwin et al., listed as inventors (the Litwin '387 Patent). The Examiner has stated that:

"The Litwin '387 Patent disclose a method for making the monoclonal antibody of DX9 comprising generation immunized mice with human NK clone VL186-1, fusing with spleenocytes with Sp2/0. The Litwin '387 Patent disclose that the antigen recognized by DX9 is present on a subset of NK cells in adult peripheral blood, therefore VL186-1 is a biological equivalent of a natural killer cell surface receptor."

Claims 19 and 30 have been canceled by the Applicants, and the term "biological equivalents" has been removed from all claims. Furthermore, the amended Claims 14-16, 20, 25-27, and 32 now contain specific limitations (e.g. SeqID#3, SeqID#4, SeqID#5 or combination thereof) on the proteinaceous molecules that are utilized to produce the monoclonal antibodies and fusion cell lines. Support for the amended claims appear on Page 8, lines 22-23; Example 2 Page 16, lines 13-15; and Figure 7.

A claim is only anticipated if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *See Verdegaal Bros. v. Union Oil Co. of California*, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987).

The Litwin '387 Patent does not describe, either expressly or inherently, the Applicants' claimed monoclonal antibody, as amended, or cell fusion line, as amended, of the instant invention. Thus, the Litwin '387 Patent does not anticipate the amended Claims 14-16, 20, 25-27, and 32. Applicants therefore traverse the Examiner's rejections and respectfully request the Examiner withdraw the rejections.

C. 35 U.S.C. 102(b).

The Examiner has also rejected Claims 14-21, 23, 24-32 and 35 under 35 U.S.C. 102(b) as being anticipated by PCT Publication WO 99/63088 with Baker et al., listed as inventors (the Baker '088 Patent). The Examiner has held that:

"The Baker '088 Patent disclose an antibody made by immunizing an animal with an immunizing agent and adjuvant, wherein the immunizing agent may include the PRO polypeptide of a fusion product thereof. The Baker '088 Patent disclose the preparation of the antibodies by the monoclonal method which is the same as that claimed (page 365-367). The Baker '088 Patent disclose a Pro 1138 polypeptide of SeqID No: 253 which is identical

to the instant SeqID No:2. Thus, the antibody disclosed by The Baker '088 Patent will inherently have the same claimed properties as the instant antibody."

Claims 17, 18, 19, 23, 24, 28, 29, 30 and 35 have been canceled by the Applicants. The amended Claims 14-16, 20-22, 25-27, and 31-33 now contain specific limitations (e.g. SeqID#3, SeqID#4, SeqID#5 or combination thereof) on the proteinaceous molecules that are utilized to produce the monoclonal antibodies and fusion cell lines. Support for the amended claims appear on Page 8, lines 22-23; Example 2 Page 16, lines 13-21; and Figure 7.

There are many factors affecting monoclonal antibody and cell fusion line production that are known in the art (BBRC Volume 303, Issue 3 , 11 April 2003 , Pages 733-744, Monoclonal Antibody Protocols (Methods in Molecular Biology, 45), William C. Davis WC (Editor), Publisher: Humana Press; Spiral edition (1995), ISBN: 0896033082). In particular, the size and purity of the antigen may affect the secondary structure of the antigen and the overall outcome of antibody producing procedures. Applicants assert that the Baker '088 patent cited as anticipatory disclose the use of the entire single 335 amino acid peptide, but NOT SHORTER PEPTIDES having SeqID#3, SeqID#4, SeqID#5 or combination thereof for the production of monoclonal antibodies or cell fusion lines. Thus, the antibody disclosed by Baker '088 Patent will NOT have the same inherent properties as the instant antibody, and support for this is found on page 16, Example 2, lines 16-21 of the current application, wherein a computer program was utilized to predict the antigeinecity of the peptides vs. the entire gene. Thus, the Baker '088 Patent does not anticipate any of the monoclonal antibodies recited in the amended claims 14-16, 20-22, 25-27, and 31-33. Applicants therefore traverse the Examiner's rejections and respectfully request the Examiner withdraw the rejections.

D. 35 U.S.C. 102(b).

The Examiner has also rejected Claims 14-35 under 35 U.S.C. 102(b) as being anticipated by PCT Publication WO 01/46260 with Starling et al., listed as inventors (the Starling '260 Patent). The Examiner has held:

"The Starling '260 Patent disclose antibodies to the extracellular domain of the APEX-1 protein of SeqID No:4 which is identical to the instant SeqID No2: The Starling '260 Patent further disclose that APEX-1 is in the CD2 subfamily of Extracellular domains

which is the specific limitations of Claims 17 and 28. The Starling '260 Patent disclose the preparation of antibodies by APEX-GST fusion proteins and the generation of hybridomas by the method of Kohler and Milstien. Thus, the monoclonal antibodies and the cell lines producing them will have the same characteristic as the instant antibodies and cell lines."

Claims 17, 18, 19, 23, 24, 28, 29, 30 and 35 have been canceled. The amended Claims 14-16, 20-22, 25-27, and 31-33 now contain specific limitations (e.g. SeqID#3, SeqID#4, SeqID#5 or combination thereof) on the proteinaceous molecules that are utilized to produce the monoclonal antibodies and fusion cell lines. Support for the amended claims appear on Page 8, lines 22-23; Example 2 Page 16, lines 13-21; and Figure 7.

As discussed above in the Baker '088 Patent, there are many factors affecting monoclonal antibody and cell fusion line production that are known in the art. Applicants assert that the Starling '260 Patent cited as anticipatory disclose the use of the entire single 335 amino acid peptide, but NOT SHORTER PEPTIDES having SeqID#3, SeqID#4, SeqID#5 or combination thereof for the production of monoclonal antibodies or cell fusion lines. Thus, the antibody disclosed by Starling '260 Patent will NOT have the same inherent properties as the instant antibody, and support for this is found on page 16, Example 2, lines 16-21 of the current application, wherein a computer program was utilized to predict the antigeinecity of the peptides vs. the entire gene. Additionally, the preparation of antibodies using APEX-GST fusion protein as an antigen and the resulting hybridomas are inherently different than the fusion cell lines of the instant invention. Thus, the Starling '260 Patent does not anticipate any of the monoclonal antibodies or fusion cell lines recited in the non-canceled amended claims 14-16, 20-22, 25-27, and 31-33. Applicants therefore traverse the Examiner's rejections and respectfully request the Examiner withdraw the rejections.

IV. Double Patenting

The Examiner has held that:

"Claims 14-16 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 17 and 18 of co-pending Application No 09/475,365 ("the '365 Application"). Although the conflicting claims are not identical, they are not patentably distinct form each other because the

monoclonal antibodies of claims 17 and 18 can anticipate the instant claims 14-16. Claims 14-16 are a product by process, but it appears that the product of the '365 Application would have identical properties to the instant antibodies of claims 14-16. This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented."

The usual inquiry regarding double patenting of the obvious type is whether the claims of the second patent are obvious from the claims of the first. Claims 17 and 18 of the '365 Application are drawn to an antibody and monoclonal antibody having specific binding affinity for a LLT1 polypeptide having 191 amino acids as follows:

MHDSNNVEKDITPSELPANPGCLHSKEHSIKATLIWRLFFLIMFLTIIVCGMVA
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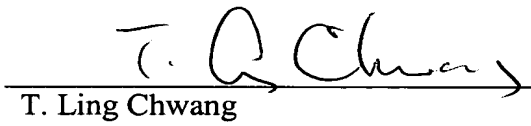
In contrast, the amended Claims 14-16 are drawn to a monoclonal antibody that specifically binds the proteinaceous molecules having peptide sequences SeqID#3, SeqID#4, SeqID#5, or combination thereof. Because the proteinaceous molecules that are utilized as antigens to produce the monoclonal antibodies of the instant invention do not share sequence homology with the LLT1 polypeptide, it would NOT have been obvious to one with ordinary skill in the art exactly how to produce a monoclonal antibody that bind specific peptide sequences (e.g. SeqID#3, SeqID#4, SeqID#5) without prior knowledge of the said specific peptide sequences. The Examiner held that "the '365 Application would have identical properties to the instant antibodies of claims 14-16," however, the applicants submit that the binding property of monoclonal antibodies to LLT1 and peptide sequence SeqID#3, SeqID#4, SeqID#5 are distinct. The ability to bind a specific antigen is the hallmark of a monoclonal antibody. Since the '365 Application does NOT teach antigens having peptide sequence SeqID#3, SeqID#4, or SeqID#5, the '365 Application and the current application are patentably distinct. Furthermore, the co-pending '365 Application Patent could NOT have rendered obvious any of the monoclonal antibodies recited in the amended claims 14-16 because antigens having SeqID#3, SeqID#4, or SeqID#5 were not disclosed in the '365

Application. Applicants therefore traverse the Examiner's provisional rejections and respectfully request the Examiner withdraw the obviousness-type double patenting rejection.

In view of the foregoing remarks, Applicants now see all the amended and new claims currently pending in this Application to be in condition for allowance and therefore earnestly solicit a Notice of Allowance for Claims 14-16, 20-22, 25-27, 31-33 and 38-43.

If the Examiner has any other matters that pertain to the above-referenced patent application, the Examiner is invited to contact the undersigned to resolve these matters by Examiner's Amendment where possible.

Respectfully Submitted,



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August 18, 2004
Dated

Appendix 1
Sequence Listing

SEQUENCE LISTING

<110> University of North Texas Health Science Center at Fort Worth
Mathews, Porunellor A.
Boles, Kent

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